Part VII

Climatic Considerations

In Part VII, we shift from the rocks, fossils, and surface features, to climatic considerations. The Cenozoic is well known for its subtropical to tropical plants and animals at mid and high latitudes. Moreover, there is also a Cenozoic mix of warm and cool climate types. Such warm climate fossils are totally out of character with the inferred warm Cenozoic climate that advocates of post-Flood catastrophism must postulate.

Moreover, the Cenozoic was a period of extensive volcanism. This volcanism would have produced “volcanic winter” with darkness probably for hundreds of years. Most of the Earth’s biosphere would likely die. And if that is not enough, a similar situation would have occurred with meteorite and/or comet impacts during the Cenozoic. These also would have caused “impact winter” to greatly stress the biosphere.

Chapter 29

Cenozoic Warmth at Mid and High Latitudes Not Post-Flood

There are abundant plant (paleoflora) and animal (paleofauna) fossils in the Cenozoic that indicate a warm climate. These warm climate fossils are commonly found at mid and high latitudes,[1] presenting a stark contrast with the climate in those regions today. Since 1980, many warm climate paleoflora sites have been discovered at the *highest latitudes of both hemispheres*. These plant fossils have been dated from the upper Devonian through the early Cenozoic,[2] but most are late Mesozoic and early Cenozoic.[3] We will be concerned only with the Cenozoic examples in this chapter.

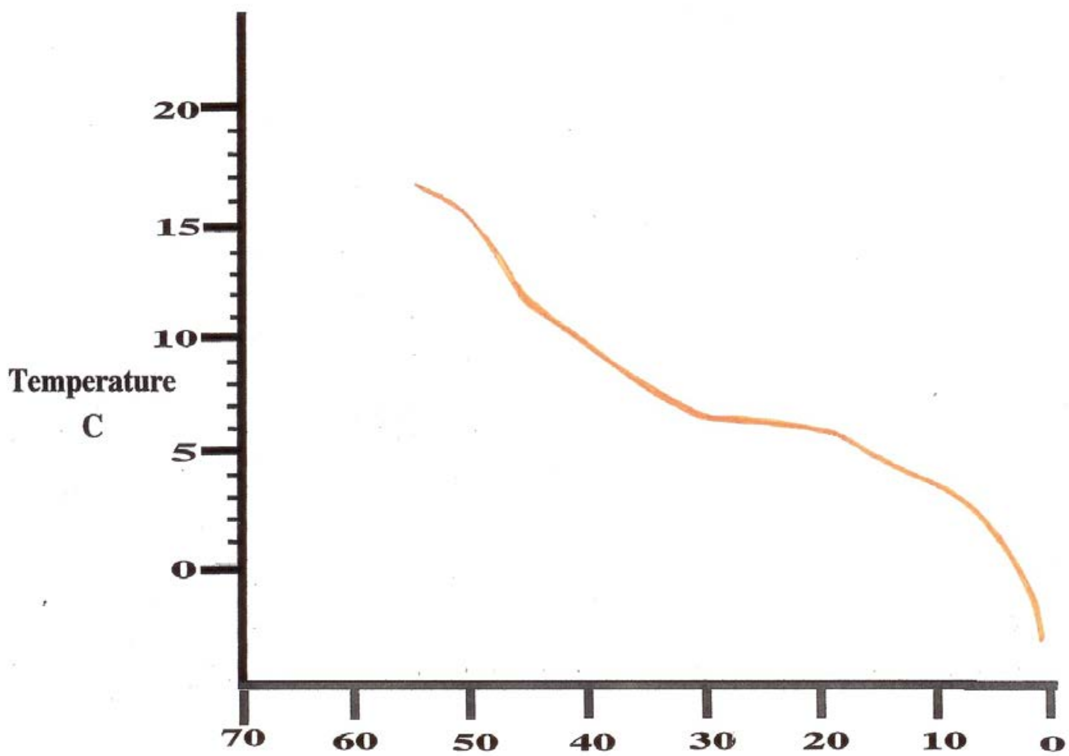

Figure 29.1. Inferred Tertiary cooling curve for the bottom of the ocean off Antarctica based on oxygen isotopes of benthic foraminifera from Deep Sea Drilling Project sites 277, 279, and 281 (originally drawn by Mrs. Melanie Richard but redrawn by Emily Moes). This cooling trend is similar to that expected at mid and high latitudes of the Cenozoic.

---

[1] Hickey, L.J., West, R.M., Dawson, M.R. and Choi, K.K., 1983. Arctic terrestrial biota: paleomagnetic evidence of age disparity with mid-northern latitudes during the Late Cretaceous and Early Tertiary. *Science* 221:1,153–1,156.
[2] Creber, G.T. and Chaloner, W.G., 1984. Influence of environmental factors on the wood structure of living and fossil trees. *The Botanical Review* 50:357–448.
[3] Creber, G.T. and Chaloner, W.G., 1985. Tree growth in the Mesozoic and Early Tertiary and the reconstruction of palaeoclimates. *Palaeogeography, Palaeoclimatology, Palaeoecology* 52:35–60.

The early Cenozoic is considered one of the warmest periods in Earth history. In regard to the late Cenozoic, the average temperatures associated with fossil plants are cooler than those of the early Cenozoic, but still significantly warmer than today.[4,5,6,7,8,9] The late Cenozoic is assumed to be a time of gradual cooling from a warm Mesozoic and early Cenozoic to the multiple Quaternary ice ages in the very late Cenozoic (Figure 29.1), assuming the geological column and uniformitarian ice age history.

This chapter will give a few detailed examples of warm Cenozoic paleoflora and paleofauna at mid and high latitudes. I will also note that paleoflora sites sometimes possess a mix of plants or plant pollen from different climates and environments. This information is significant for determining the location of the Flood/post-Flood boundary.

Worldwide Warm Climate

Fossils show warm-climate fossil plants are common at mid- and high-latitudes during the Mesozoic and early Cenozoic. There are many sites in central Siberia, where plant fossils and pollen indicate mild climates.[10,11] During the early Cenozoic, palms and mangroves are among the tropical fossils found in southern England;[12] palms and swamp cypress are found on the island of Spitsbergen in the Svalbard archipelago, north of Norway at 80°N;[13] and petrified palm fruits have been discovered in northwestern Greenland.[14] Tropical and subtropical plant and animal fossils, such as palms and crocodiles, are found in the Green River Formation (early Cenozoic) in the central Rocky Mountain basins.[15] This formation is far from the ocean and straddles the continental divide near 8,000 feet (2,440 m) in southwest Wyoming. Early Cenozoic crocodiles, large tortoises that cannot hibernate, tree ferns, and palm fossils are found not only in Wyoming, but also farther north in Montana.[16,17,18] All of these fossils are greatly out of place for the climate and conditions that exist in those locations today.

---

[4] Chaney, R.W., 1959. Miocene floras of the Columbia Plateau: Part I. composition and interpretation. *Carnegie Institution of Washington Publication 617*, Washington D. C., pp. 1–134.
[5] Clutter, T., 1985. The Clarkia fossil bowl. *American Forests* 91(2):22–25.
[6] Cronin, T.M. and Dowsett, H.J.,1993. PRISM—warm climates of the Pliocene. *Geotimes* 38(11):17–19.
[7] Funder, S., Abrahamsen, N., Bennike O. and Feyling-Hanssen, R.W., 1985. Forested Arctic: evidence from North Greenland. *Geology* 13:542–546.
[8] Hills, L.V. and Ogilvie, R.T., 1970. *Picea banksii n. sp.* Beaufort Formation (Tertiary), northwestern Banks Island, arctic Canada. *Canadian Journal of Botany* 48:457–464.
[9] Matthews, Jr., J.V., 1987. Plant macrofossils from the Neogene Beaufort Formation on Banks and Meighen Islands, District of Franklin. *Geological Survey of Canada Paper 87-1A.* Ottawa, Canada, pp. 73–87.
[10] Spicer, R.A., Ahlberg, A., Herman, A.B., Hofmann, C.-C., Raikevich, M., Valdes P.J. and Markwick, P.J., 2008. The Late Cretaceous continental interior of Siberia: a challenge for climate models. *Earth and Planetary Science Letters* 267:228–235.
[11] Oard, M.J., 2009. Climate models fail to produce warm climates of the past. *Journal of Creation* 23(2):11–13; http://creation.com/climate-models-fail.
[12] Collinson, M.E. and Hooker, J.J., 1987. Vegetational and mammalian faunal changes in the Early Tertiary of southern England; in: Friis, E.M., Chaloner, W.G. and Crane P.R. (Eds.), *The Origins of Angiosperms and Their Biological Consequences.* Cambridge University Press, Cambridge, U.K., pp. 259–303.
[13] Schweitzer, H.-J., 1980. Environment and climate in the early Tertiary of Spitsbergen. *Palaeogeography, Palaeoclimatology, Palaeoecology* 30:297–311.
[14] Koch, B.E., 1963. Fossil Plants from the Lower Paleocene of the Agatdalen (Angmârtussut) area, central Nûgssuaq Peninsula, northwest Greenland. *Meddelelser Om Grønland* 172(5):1–120.
[15] Grande, L., 1984. Paleontology of the Green River Formation with a Review of the Fish Fauna. *The Geological Survey of Wyoming Bulletin 63*, Laramie, WY.
[16] Brattstrom, B.H., 1961. Some new fossil tortoises from western North America with remarks on the zoogeography and paleoecology of tortoises. *Journal of Paleontology* 35:543–560.

Figure 29.2. Swamp cypress from eastern South Carolina within a Carolina Bay.

[17] Wing, S.L. and Greenwood, D.R., 1993. Fossils and fossil climate: the case for equable continental interiors in the Eocene. *Philosophical Transactions of the Royal Society of London B* 341:243–252.
[18] Kerr, R.A., 1993. Fossils tell of mild winters in an ancient hothouse. *Science* 261:682.

Miocene, or early Late Cenozoic warm climate fossils, like palms, are found in central Germany.[19] Miocene large tortoises and crocodiles are found as fossils in Midwest United States, as well as southern Saskatchewan, indicating at one time there was at least a subtropical climate.[20,21]

Alaska

Fossil plants from warm climates are abundant in Alaska. Jack Wolfe has documented palms, swamp cypress, mangroves, climbing vines, and other plants that normally are found in a warm, if not tropical climate.[22] Swamp cypress is common in Florida swamps and other areas of the southeast United States (Figures 29.2). Fossil plants representing cooler climates are also found in Alaska, but are relegated to a "cool period" during the warm early Cenozoic.[23] Wolfe has also developed a sophisticated computer program to determine the climate, based on multiple characteristics of leaves in comparison with modern plants and their climate.[24,25] His computer program confirmed the early Cenozoic climate of southern Alaska was subtropical to nearly tropical, even though plate tectonic projections place Alaska at the same high latitude it inhabits today. Wolfe found the same vegetation in British Columbia and Siberia.

Northwest United States

Northwest United States is well known for numerous Cenozoic paleoflora sites. Palm leaves and cycads from a warm climate are sometimes found in the early Cenozoic Chuckanut Formation south of Bellingham, Washington (Figure 29.3). Some of the 130 species of plants found in thin shale at Clarkia, Idaho come from a warm-temperate to subtropical climate, such as the avocado, magnolia, and sycamore.[26] The Clarkia paleoflora is dated as Miocene, the early part of the late Cenozoic. Tropical and subtropical fossils are common in the early Cenozoic of the John Day Country of north-central Oregon.

Northeast Canada

One of the most difficult plant fossil sites for uniformitarian scientists to explain is that of unfossilized, mummified "forests" and leaf litters in the Geodetic Hills on Axel Heiberg Island.

---

[19] Mosbrugger, V., Gee, C.T., Belz, G., and Ashraf, A.R., 1994. Three dimensional reconstruction of an in-situ Miocene peat forest from the Lower Rhine Embayment, northwestern Germany—new methods in palaeovegetaton analysis. *Palaeogeography, Palaeoclimatology, Palaeoecology* 111:295–317.

[20] Markwick, P.J., 1998. Fossil crocodilians as indicators of Late Cretaceous and Cenozoic climates: implications for using palaeontological data in reconstructing palaeolclimate. *Palaeogeography, Palaeoclimatology, Palaeoecology* 137:205–271.

[21] Holman, J.A., 1971. Climatic significance of giant tortoises from the Wood Mountain Formation (Upper Miocene) of Saskatchewan. *Canadian Journal of Earth Sciences* 8:1,148–1,151.

[22] Wolfe, J.A., 1977. Paleogene floras from the Gulf of Alaska region. *U.S. Geological Survey Professional Paper 997*. U. S. Government Printing Office, Washington D.C..

[23] Wolfe, J.A., 1985. Distribution of major vegetational types during the Tertiary; in: Sundquist, E.T. and Broecker W.S. (Eds.), *The Carbon Cycle and Atmospheric* CO_2*: Natural Variations Archean to Present.* Geophysical Monograph 32, American Geophysical Union, Washington D. C., pp. 357–375.

[24] Wolfe, J.A., 1978. A paleobotanical interpretation of Tertiary climates in the Northern Hemisphere. *American Scientist* 66:694–703.

[25] Wolfe, J.A., 1993. A method of obtaining climatic parameters from leaf assemblages, *U.S. Geological Survey Bulletin 2040*, U. S. Government Printing Office, Washington, D.C.

[26] Smiley, C.J. (Ed.), 1985. *Late Cenozoic History of the Pacific Northwest—Interdisciplinary Studies on the Clarkia Fossil Beds of Northern Idaho*, Pacific Division of the American Association for the Advancement of Science, San Francisco, CA.

This find is located at 80°N latitude in the Queen Elizabeth Islands of Canada and dated early Cenozoic.[27] Contrary to the present climate, the trees, leaves, cones, and fruits found in the deposits of the Geodetic Hills indicate a much warmer, wetter climate. Tree rings in the stumps are unusually thick, typically 0.1 of an inch (3 mm) wide with a maximum of 0.4 of an inch (10 mm), showing little or no indication of growth stress.[28] Early Tertiary vertebrate fossils have been found near the plant sites on west-central Ellesmere Island. They include varanid lizards, snakes, salamanders, tortoises, alligators, birds, and several mammals, including rodents, horses, and brontotheres, which are an extinct type of rhinoceros.[29,30,31,32] Flying lemurs uncovered there are of particular note because they need a year-round supply of seeds and fruits in the trees, indicating temperatures above freezing *year round*! The animals, like the trees, suggest a warm, possibly even subtropical climate with little seasonal contrast.[29,30,31,33]

Figure 29.3. Palm fossil from the early Cenozoic Chuckunut Formation south of Bellingham, Washington, USA.

[27] Oard, M.J., 2003. Cold oxygen isotope values add to the mystery of warm climate wood in NE Canada. *Journal of Creation* 17(1):3–5; http://creation.com/images/pdfs/tj/j17_1/j17_1_3-5.pdf.
[28] Greenwood, D.R. and Basinger, J.F., 1993. Stratigraphy and floristics of Eocene swamp forests from Axel Heiberg Island, Canadian arctic archipelago. *Canadian Journal of Earth Sciences* 30:1,914–1,923.
[29] Francis, J.E., 1988. A 50-million-year-old fossils forest from Strathcona Fiord, Ellesmere Island, arctic Canada: evidence for a warm polar climate. *Arctic* 41:314–318.
[30] Estes, R. and Hutchison, J.H., 1980. Eocene lower vertebrates from Ellesmere Island, Canadian Arctic Archipelago. *Palaeogeography, Palaeoclimatology, Palaeoecology* 30:225–247.
[31] McKenna, M.C., 1980. Eocene paleolatitude, climate, and mammals of Ellesmere Island. *Palaeogeography, Palaeoclimatology, Palaeoecology* 30:349–362.
[32] West, R.M., Dawson, M.D. and Hutchison, J.H., 1977. Fossils from the Paleogene Eureka Sound Formation, N. W. T. Canada: occurrence, climatic and paleogeographic implications; in: West, R.M. (Ed.), *Paleontology and Plate Tectonics*, Milwaukee Public Museum Special Publications in Biology and Geology No. 2, Milwaukee, WI, pp. 77–93.
[33] Brattstrom, B.H., 1961. Some new fossil tortoises from western North America with remarks on the zoogeography and paleoecology of tortoises. *Journal of Paleontology* 35:543–560.

Scientists have been able to put some numbers to the early Cenozoic climate on Axel Heiberg Island. During the Eocene, the region had an estimated mean temperature of 55 to 59°F (13 to 15°C), a coldest month mean of about 39°F (4°C), and a mean annual precipitation greater than 47 inches (120 cm).[34] This estimate is based on fossils of alligators, tortoises, flying lemurs, and other mammals and their climatic tolerances. The climate today is very different. Axel Heiberg and Ellesmere Islands are mostly frozen all year round; the only live trees are a few dwarf willows that grow about an inch high in the short summer. The current annual average temperature for the area is about -4°F (-20°C) with an annual average precipitation of only 2.5 inches (6.5 cm).[35] The average temperature for the coldest month of the year is -36°F (-38°C),[36] and the lowest temperatures are around -67°F (-55°C) in winter. Eocene temperatures must have been 63° to 72°F (35 to 40°C) warmer than today.[34,37] Considering winter minimums, their temperatures were probably as much as 99°F (55°C) warmer than today, and precipitation was more than 18 times the current rate. That is a radically different climate compared to today.

Mix of Fossil Plants from Widely Divergent Climates

One of the challenges of the Axel Heiberg Island paleoflora is the wide variety of plants and pollen from many climate zones, such as hickory, maple, elm, ash, alder, birch, beech, oak, pine, fir, cedar, hemlock, and katsura,[38,39,40] most of which indicate a warm, wet climate. The climate range varies from cool temperate to warm temperate.[41] Swamp cypress today grows in the swamps of the Alabama wetlands,[42] the Florida Everglades,[43] or other areas of the southeast U.S. (Figure 29.2). The spruce, larch, birch, and white pine, usually represent a cooler climate.[44]

---

[34] Greenwood, D.R., Basinger J.F., and Smith, R.Y., 2010. How wet was the Arctic Eocene rain forest? Estimates of precipitation from Paleogene Arctic macrofloras. *Geology* 38(1):15–18.
[35] Tarnocai, C. and Smith, C.A.S., 1991. Paleosols of the fossil forest area, Axel Heiberg Island; in: Christie, R.L. and McMillan N.J. (Eds.), Tertiary Fossil Forests of the Geodetic Hills, Axel Heiberg Island, Arctic Archipelago, *Geological Survey of Canada Bulletin 403*, Ottawa, Canada, pp. 171–187.
[36] Pearce, F., 1992. Ancient forests muddy global warming models. *New Scientist* 140(1901), pp. 6–7.
[37] Eberle, J., Fricke H. and Humphrey, J., 2009. Lower-latitude mammals as year-round residents in Eocene Arctic forests. *Geology* 37(6):499–502.
[38] Francis, J.E., 1990. Polar fossil forests. *Geology Today* 6:92–95.
[39] Basinger, J.F., 1991. The fossil forests of the Buchanan Lake Formation (early Tertiary), Axel Heiberg Island, Canadian arctic archipelago: preliminary floristics and paleoclimate; in: Christie, R.L. and McMillan N.J. (Eds.), Tertiary Fossil Forests of the Geodetic Hills, Axel Heiberg Island, Arctic Archipelago, *Geological Survey of Canada Bulletin 403*, Ottawa, Canada, pp. 39–56.
[40] McIntyre, D.J., 1991. Pollen and spore flora of an Eocene forests, eastern Axel Heiberg Island, N.W.T.; in: Christie, R.L. and McMillan N.J. (Eds.), Tertiary Fossil Forests of the Geodetic Hills, Axel Heiberg Island, Arctic Archipelago, *Geological Survey of Canada Bulletin 403*, Ottawa, Canada, pp. 83–97.
[41] McIntyre, D.J., 1991. Pollen and spore flora of an Eocene forests, eastern Axel Heiberg Island, N.W.T.; in: Christie, R.L. and McMillan N.J. (Eds.), Tertiary Fossil Forests of the Geodetic Hills, Axel Heiberg Island, Arctic Archipelago, *Geological Survey of Canada Bulletin 403*, Ottawa, Canada, pp. 83–97.
[42] Francis, J.E., 1991. The dynamics of polar forests: Tertiary fossil forest of Axel Heiberg Island, Canadian arctic archipelago; in: Christie, R.L. and McMillan N.J. (Eds.), Tertiary Fossil Forests of the Geodetic Hills, Axel Heiberg Island, Arctic Archipelago, *Geological Survey of Canada Bulletin 403*, Ottawa, Canada, pp. 29–38.
[43] Francis, J.E., 1991. Arctic Eden. *Natural History* 100(1):57–64.
[44] Obst, J.R., McMillan, N.J., Blanchette, R.A., Christensen, D.J., Faix, O., Han, J.S., Kuster, T.A., Landucci, L.L., Newman, P.J., Petterson, R.C., Chwandt V.H. and Mesolowski, M.F., 1991. Characterization of Canadian arctic fossil woods; in: Christie, R.L. and McMillan N.J. (Eds.), Tertiary Fossil Forests of the Geodetic Hills, Axel Heiberg Island, Arctic Archipelago, *Geological Survey of Canada Bulletin 403*, Ottawa, Canada, pp. 123–146.

Two hundred or more species of plants that range from tropical jungles to cool temperate regions are associated with the Yellowstone fossil "forests" of the early Cenozoic.[45] The same climatic mix is also found at Ginkgo Petrified Forest State Park in Washington State,[46] but this is dated as late Cenozoic, the time the temperature was supposedly cooling toward the future ice ages. So the cooler climate plants "fit" the location, but the warm climate plants do not. For instance, warm climate *Eucalyptus*, bald cypress, teak, breadfruit, cinnamon, and gum are found here, and they are juxtaposed with cool climate trees such as spruce, larch, and birch.

Other examples of this mixing of paleoflora are found near the Ruby River area of southwestern Montana, where swamp cypress and a tropical vine are found together with pine, spruce, and fir.[47] In northeastern Washington State, at the town of Republic, fossil plants from diverse climates are found in shale (Figure 29.4).[48,49,50] It is estimated that 450 species of plant fossils have been found at Republic and nearby Princeton, British Columbia, of the Okanogan Highlands.

Uniformitarian scientists try to explain these unusual plant combinations by claiming that cooler climate plants grew in much higher elevations and were washed down into the subtropical and tropical lowlands. This explanation is employed by park authorities for the mix of 200 species of trees and plants from tropical and cool temperate climates at Ginkgo Petrified Forest State Park in Washington. However, there is a problem. There is no evidence for the proposed 'highlands' in the sedimentary and volcanic rocks within 50 miles (80 km) of the area. Thus, the uniformitarian explanation is extremely weak and obviously a dodge.

Computer Simulations Indicate Cold Winters

Uniformitarian scientists have attempted to apply computer climate simulations to the data in order to understand the inferred warm climates at mid and high latitudes.[51] No matter if the altitude is lower, the ocean temperatures much warmer, carbon dioxide higher, etc, the computer simulations all fail to produce warm winters at high latitudes and mid latitude continental interiors. Abbot and Tziperman write:

> Researchers have as yet been unable to reproduce equable climates in coupled ocean-atmosphere global climate models (GCMs) by simply changing boundary conditions and increasing greenhouse gas levels … Relative to existing data, either the polar regions are too cold or the tropical regions are too warm in these simulations.[52]

Climate modelers continue to tweak their models to simulate an equable, warm climate at high latitudes. Under pressure from the geologists, their attempts to solve this "problem" by

---

[45] Coffin, H.G., 1997. The Yellowstone petrified "forests." *Origins* 24(1):5–44.
[46] Coffin, H.G., 1971. Vertical flotation of horsetails (*Equisetum*): geological implications. *GSA Bulletin* 82:2,019–2,022.
[47] Becker, H.F., 1961. Oligocene plants from the upper Ruby River Basin, southwestern Montana. *GSA Memoir 82*, Geological Society of America, Boulder, CO.
[48] Wolfe, J.A. and Wehr, W., 1987. Middle Eocene dicotyledonous plants from Republic, Washington, *U.S. Geological Survey Bulletin 1597*, U. S. Government Printing Office, Washington, D.C.
[49] Labandeira, C.C., 2002. Paleobiology of middle Eocene plant-insect associations from the Pacific Northwest: a preliminary report. *Rocky Mountain Geology* 37(1):31–59.
[50] Oard, M.J., 1998. Tropical cycad reinforces uniformitarian paleofloristic mystery. *Journal of Creation* 12(3):261–262; http://creation.com/images/pdfs/tj/j12_3/j12_3_261-262.pdf.
[51] Oard, M.J., 2014. *The Genesis Flood and Floating Log Mats: Solving Geological Riddles*. CMI ebook, Creation Book Publishers, Powder Springs, GA.
[52] Abbot, D.S. and Tziperman, E., 2008. Sea ice, high-latitude convection, and equable climates. *Geophysical Research Letters* 35, L03702,1–2.

manipulating the climate simulations have had modest success, but they use extreme values for some of the variables. Why do the simulations fail? The answer can be found in elementary meteorology. Winter temperatures on continents are primarily caused by *little or no sunshine*, or a low angle of the sun. There is nothing that can be done about it

Figure 29.4. Outcrop of shale at Republic, northeast Washington State, where 450 species of fossil plants have been found, including a subtropical to tropical cycad fossil.

The Boundary Is in the Late Cenozoic

The evidence of Cenozoic tropical and subtropical fossil plants at mid and high latitudes, the mix of warm and cold climate types, and the failure of climate simulations to duplicate the implied climate are extremely perplexing to uniformitarian scientists. Not only was the climate warm, there was very little seasonal contrast between winter and summer, unlike the range today. The same problems occur for any Flood model that believes the Cenozoic or most of it is post Flood. The post-Flood climate was the time of the Ice Age with volcanic ash and aerosols in the stratosphere causing cooler summers in mid- and high-latitude continents. How can so much tropical and subtropical plants and animals be found at mid and high latitudes after the Flood? It seems impossible. So, the Flood/post-Flood boundary has to be in the Late Cenozoic, often in the very Late Cenozoic, over wide areas of the Earth.

All the paleoflora and paleofauna, including the mix of plants from various climates, finds a straightforward explanation during the Flood based on the spread of log mats around the flooded earth.[51]